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GENERAL SALES OFFICE

HARRISON, N. J.

The Lighting of Large Dry Goods and Department Stores



Information compiled by

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The Lighting of Large Dry Goods and Department Stores

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Introduction

Without artificial lighting the modern large store would not be an economic possibility. Space is too valuable in the cities so to design a building that adequate daylight can penetrate a great distance from the street. The continuous use of lighting equipment is a necessity.



FIG. 1

Night View Main Floor of a Large Department Store Lighted by 500-watt Mazda C Lamps in Spherical Opalescent Enclosing Globes, Chain Suspension.
One outlet is provided in each twenty-foot bay.

The health and welfare of the clerks are to a degree dependent on the lighting system and this factor must receive careful consideration.

Bright illumination reduces the opportunity of the shoplifter.

Who would care to purchase an article in a room where it is not possible to examine it with ease?

Lighting helps toward minimizing the return and exchange of goods.

Then there is the psychological effect of good lighting. If there are two stores handling the same grade of merchandise, one brilliantly illuminated, the other dull and unattractive, there is no question which one you would patronize.

The advertising feature of lighting which compels attention has been recognized for a long while, hence our white-ways, bright show windows, and sparkling electric signs. If your store is well illuminated, it will draw the crowd.

Good lighting puts the customer in a pleasant frame of mind. It makes sales work easier, and this in turn helps to keep clerks and employees cheerful and courteous.

The value of proper illumination is so self-evident that there is no necessity to dwell at length on its advantages. This publication is not intended to tell you why a store should be well illuminated, for this subject has been presented so many times that it can be assumed that everyone is convinced.

There are many methods of illuminating an interior, all of which can be used for a store. Some are especially well suited, others not so well adapted. This bulletin presents a more or less critical study of the situation from a semi-engineering viewpoint, and gives facts so that the merchant can form his own opinions as to what is most suitable for his particular establishment.

General Considerations Applying to Store Lighting

First: The store should not be under-illuminated, thus presenting a gloomy appearance, on the other hand, in many cases the displays are well lighted from the standpoint of enough light actually reaching them, and yet the store may be disagreeable and uninviting.

Second: To make the store pleasant, lamps must be properly placed and so shielded that they are not glaring.

Third: The lighting equipment must be artistic and well arranged so that it will produce a pleasing appearance without drawing one's attention away from the merchandise.

In general, store managers are a most progressive group of men in adopting the latest and best form of illumination. Every development is tried by the merchant to see whether or not conditions can be improved. As a result of this very progressiveness, only a few years ago, as one passed through the retail section of a city, he saw a different type of illumination in almost every store. Then the MAZDA lamp appeared on the market and was tried out

in a few representative stores. Its success was instantaneous, and now it is almost without exception the universal illuminant. To the casual observer, this rapid superseding of all other forms of illuminants is little short of marvelous, but when we stop to consider the inherent advantages of the MAZDA lamp, it is to be expected.

Desirable Intensity of Illumination

It is quite evident that there is a certain desirable range of intensities of illumination to properly display different kinds of goods. A book department will demand more light than a white goods display, a shoe shop requires more light than furniture, and so on. Where goods of different character are on display in the same department, it is necessary to supply sufficient light for those most difficult to illuminate. Tables have been worked out by competent engineers for the convenience of those who care to use them, giving the desirable quantity of light for the different departments. A typical table is presented below:

	FOOT-CANDLE*
Art (light on exhibits).....	5-10
Book.....	4-6
China.....	5-4
Cigar.....	5-8
Clothing.....	5-9
Cloak and suit.....	5-9
Confectionery.....	4-7
Drug.....	4-6
Dry goods.....	5-8
Florist.....	4-5
Furniture.....	3-4
Fur.....	7-9
Groceries.....	4-6
Haberdashery.....	6-9
Hardware.....	4-7
Hat (men's).....	5-8
Jewelry.....	6-9
Millinery.....	5-7
Music.....	4-6
Notions.....	4-7
Piano.....	5-4
Rug racks.....	8-10
Shoe.....	5-8
Stationery.....	4-6
Wall paper.....	4-5

*The foot-candle is the unit of intensity of illumination.

The large number of sizes of standard MAZDA lamps permits them to fit in particularly well with this situation. Suppose a certain type of fixture is adopted for an entire floor (this is, of course, a desirable condition) where the maximum light is needed,

say, in the fur department; 200-watt MAZDA C lamps might be used; if the notions department were on the same floor, then 100-watt MAZDA C lamps on the same spacing would give sufficient light, while in the furniture department as low as the 75-watt size would serve. This assumes, of course, that the store is so arranged that the variation in light does not produce an inartistic effect.

Color of Light and Diffusion

The demands of the department store as to color of light are discussed in considerable detail in Bulletin Index 3, "Artificial Daylight for Merchandising and Industry," and need not be repeated here. While Daylight MAZDA lamps are used in many instances for general illumination and offer many advantages, the most generally accepted practice is to use the warm, unmodified light of the MAZDA C lamp for this purpose. At what might be called strategic points, such as ribbon counters, triplicate mirrors in the clothing department, piece goods department, etc., are located accurate color identification units as discussed in the above mentioned reference. This arrangement provides a pleasing appearance in the store proper, permits accuracy in selection of material resulting in satisfied customers, and causes a remarkable saving of time which would otherwise be lost in carrying merchandise to a window or doorway for inspection.

Two of the points of importance in store lighting have been discussed, and there is another important factor, namely, diffusion. With the present-day brilliant light sources this is of special importance. Diffusion can be secured by increasing the apparent size of the light source, either by the use of depolished reflecting surfaces or translucent globes or shades. Diffusion eliminates sharp shadows as well as excessive intrinsic brilliancy of the source, and we speak of it in opposition to glare. Glare has been aptly described as light out of place. It reduces the ability to see, fatigues the eye, and, if severe, will undoubtedly have a permanent effect on the visual mechanism. It is, therefore, a thing to be avoided.

Arrangement and Systems of Lighting

In the early days, when only inefficient lamps without effective reflectors were available, it was sometimes necessary to place lighting units close to the counter, in order to obtain sufficient illumination without undue expense. Needless to say, this scheme was

not productive of attractive stores. Now general lighting is universally used. Lamps are arranged symmetrically with regard to the bays or pillars, and the whole floor uniformly lighted. It is not necessary to take into account the position of the counters when spacing the lamps, for a sufficiently high intensity is provided everywhere for one to examine carefully the goods on display. If the rules for spacing outlets are observed there need be no fear of objectionable shadows in any part of the building.



FIG. 2

Neatness and a Businesslike Appearance is Created in This Instance by the Use of a Stalactite Shaped Opalescent Enclosing Globe with 200-watt MAZDA C Lamps. Two Outlets per Bay

There are three generally recognized methods of applying light, known as the direct, semi-indirect, and totally indirect. All of these are applicable to the store.

Choice of Reflecting or Diffusing Equipment

As stated before, the eye should not be exposed to the unshielded filament as this is of too great a brilliancy, producing discomfort and reducing the ability to see. We, therefore, always equip the light source with some sort of a diffusing device or use a reflector

A reflector, besides reducing the brilliancy of a source, has a further advantage in redirecting the light.

There are a great many varieties from which to make a selection, and it is obviously impossible to analyze each type, so merely the various classes will be discussed with particular attention to their suitability for the department store.

The engineering features of specific types of reflectors are treated in detail in Bulletin Index 22, "Reflectors for Incandescent Lamps."

Direct Lighting—Prismatic Glass Bowl Reflectors

If these are properly designed, they are extremely efficient in directing the light in any predetermined manner. The maximum amount of light is sent to the counters, although some is transmitted upward and to the side. Since this light forms a very small percentage of the output, the effect of dark colored walls and ceilings is minimized with prismatic units. Therefore, where these conditions exist this particular type of reflector is of great service. Again, where the expense of lighting must be kept at an absolute minimum, the high utilization of the prismatic type makes it well suited. This type of unit had a very wide use a few years ago but is now largely replaced with somewhat more decorative equipment.

Opalescent Glass Deep Bowl Reflectors

These are made in a wide variety of designs of heavy, medium, and light density glass. The heavy density directs the light quite strongly into the lower hemisphere, while the light density directs a much smaller amount, transmitting a large part through the glass upward and to the side. The variation in efficiency between individual makes of any one glass—say, light density—is very slight, and a reflector should be chosen whose design or decoration seems most suitable. The highest utilization is obtained with the heavy density, while the light density, transmitting more light to the ceiling and side walls, makes the store appear brighter. This is thought by many to be a desirable condition.

With any type of open mouth reflector, prismatic or opalescent, the exposed portion of the lamp should be of a diffusing character. The bowl enameled MAZDA C lamp falls in this category.

The shallow bowl or flat opal reflector is sometimes employed for store lighting. This practice has little to recommend it, for a large portion of the lamp is visible and a glaring installation is very likely to result.

Opalescent Enclosing Globes

If the proper glass is chosen these conceal the light source from view and diffuse the light so that the entire surface of the ball is equally bright. This should, of course, be done with minimum absorption. Individual makes and varieties of glass are quite different in this respect, and in choosing equipment carefully, specifications of diffusion and loss of light should be adhered to. (There is a great variety of standard shapes and designs.)



FIG 3

A Simple, yet Effective Type of Semi-Indirect Unit with a 500 watt Daylight MAZDA Lamp is Used in Each Bay of This Store Devoted to the Sale of Silks and Chiffons. The color of light is such as to display the merchandise most advantageously.

Spherical enclosing globes do not materially change the distribution of light from that of the lamp itself, as light is sent almost equally in all directions. This is not so serious as it might appear at first thought for the light which strikes the light colored ceiling is largely reflected downward, that going to the side is useful in illuminating vertical surfaces and giving an appearance of cheerfulness and brightness to the store.

Flattened or shallow opal glass enclosing globes which tend to send the maximum light up and down rather than to the sides have recently been placed on the market. These naturally have this feature of more efficient lighting in their favor and should have a wide application.

We cannot look at the question of lighting the store as merely supplying a certain predetermined amount of light on the counters. If this were the object the most economical method would be to locate a series of projectors close to the ceiling and send strong beams of light downward, but it is obvious that this scheme would make the store appear very unattractive, and shadows would be strong and harsh. Instead of having one plane, such as the counter, to illuminate, the whole interior of the store must be lighted and the flux of light spread in all directions. From this we gather that while from a standpoint of efficiently lighting the counters, the enclosing globe, or semi-indirect unit, is not to be compared with other units, yet it is very often most suitable to give the soft flood of light in all directions necessary for the high-class shop.

Semi-Enclosing Units

A number of patented designs of reflectors fall in this class which in general consist of a lower diffusing member and an upper reflecting device. Some are one piece, others open. The upper reflector is opaque in certain types and translucent in others.

As a class they give the same order of diffusion as the enclosing globe with more directional effect. The same precautions as to adequate size must be observed. The open units are susceptible to dust collection and those with an opaque top likely to cast a dense objectionable shadow on the ceiling if care is not taken to insure proper spacing and hanging height.

Semi-enclosing units are obviously of particular service when dark surroundings prevail.

Semi-Indirect Lighting--Opalescent Bowls

The standard shapes, sizes and decorations of these are almost without number. Many are tinted and otherwise decorated. Some progressive stores have a design made especially for themselves, with a monogram of special feature etched or pressed into the structure of the dish. For the indirect systems the ceiling and walls must be light in color if the light is to be effective. Since the ceiling is the most brightly illuminated part of the structure and con-

siderable light also is thrown towards the side walls, the room appears bright—a desirable condition. Of course, for equal illumination on the counters somewhat more power must be used than that required for direct lighting.

Enclosing Semi-Indirect

While any type of lighting unit must be regularly cleaned if it is to continue effective, nevertheless inverted bowls are inherently most susceptible to the collection of dust and other foreign material



FIG. 4

A Clothing Department Lighted by 750-watt MAZDA C Lamps in Porcelain Enameled Totally Indirect Fixtures. It is necessary to provide a high intensity of light if one is to examine dark materials with ease.

This makes the depreciation of light somewhat more rapid and requires a shorter period between cleanings. To overcome this difficulty there has been recently introduced a one piece glass semi-indirect enclosing unit. The bottom and sides are enameled white giving the necessary direction and diffusive effect and the upper half is of clear glass. This is designed to have minimum absorption and is so sloped as to reduce the accumulation of dust as much as possible. The light emitting properties and quality of illumination

produced are identical with the opalescent bowls here discussed. It is apparent that this type of fixture has qualities which strongly recommend it from an operating standpoint.

Metal and Glass Semi-Indirect

A form of equipment which has a wide application consists of an inverted porcelain enameled reflector with an opening in the bottom



FIG 5

Semi-enclosing Units with 200-watt Daylight MAZDA Lamps Are Used in This Millinery Department. The light neutral floor covering with tables and show cases in harmony are elements which make this room pleasant and inviting

covered by a diffusing glass plate. With the proper curvature of the reflector and the plate in the correct relation to it a widespread distribution of light is secured and the exterior of the opaque reflector slightly illuminated. These devices give a soft pleasing quality of illumination and are susceptible of a wide variety of treatment with various ornamental accessories, such as silk, cretonne, and parchment shades, cast metal ornaments and silk diffusing screens.

Prismatic Semi-Indirect

Advantage is taken of the light controlling property of prismatic glass to produce a fixture which is efficient in directing the light to the ceiling and at the same time having a very low exterior brightness. Decorative fabric shields can be used to tone the transmitted light and ornament the bowl. Excellent artistic effects can be secured with practically no sacrifice in light.

Totally Indirect

There are two main types of totally indirect units: one employs mirrored glass bowl shaped reflectors inverted within decorative housings, the other utilizes a shallow porcelain enameled steel reflector in the same manner. The mirrored type is slightly more efficient, while the enameled variety is less expensive. Many styles of housings are available and these are finished in any tint suited to the particular interior in which they are to be installed. The illumination from the totally indirect system is very well diffused and no light source is visible. These factors cause the store to be most comfortable, and the working conditions are pleasant.

To prevent the opaque fixture appearing as a dark spot against the illuminated ceiling, a form of unit known as a luminous bowl indirect is employed. Mirrored inverted reflectors are used but a small amount of light is allowed to escape and illuminate the glass bowl which conceals the mechanism.

Summary

Attempt has been made below to classify the various types of reflecting devices suitable for use in the store, in the order of their effectiveness in certain directions. This summary is based on the average high-grade store finish of pure white and is not absolute; as, for example, some dense opalescent enclosing globes may be less efficient than a semi-indirect unit in a room with a light ceiling.

Maximum Light on the Counters for a Given Amount of Power

Efficient prismatic bowl reflectors

Opal bowl reflectors

Opalescent enclosing globes (quite dependent on the kind of glass used)

Semi-indirect

Totally indirect

Diffusion or Softness of Illumination

- Totally indirect.
- Semi-indirect.
- Opalescent enclosing globes.
- Opalescent bowl reflectors.
- Prismatic units.

Bright Appearing Store

- Opalescent enclosing globes.
- Semi-indirect.
- Opalescent bowl reflectors.
- Prismatic units.
- Totally indirect.

Selection of Fixtures

The multiple unit fixture or chandelier for direct lighting is no longer generally applied for store lighting. There is no necessity of grouping several lamps to get sufficient light, for such a wide range of sizes is available that a standard lamp giving within a few per cent of the desired output of light can be secured.

Except in those parts of the building where decoration is of major importance, e.g., the ladies' rest room, simple designs of fixtures serve best. Plain well-finished metal in the form of single stems or pipes, or a canopy and drop chain can be used to support any of the forms of direct lighting units.

The semi-indirect bowls are carried by three or four neat metal chains attached to the supporting canopy, various forms of hooks being used to attach the glassware to the chain. In general the lamp hangs pendant; sometimes a combination of a short length of pipe or reinforced cord with projecting arms is used in place of chain suspension.

The indirect equipments are usually supplied complete with chain or pipe support, finished to match the fixture.

Spacing of Outlets and Hanging Height

In the large store this is usually governed by the size of bay and the arrangement of outlets adopted. From one to five outlets can be symmetrically arranged in a square bay, and the wide range of sizes of MAZDA lamps make them especially adaptable.

Example: Consider a bay 20 by 20 feet—then the following combinations might apply.

One outlet—One 300-watt MAZDA C lamp.

Two outlets—Two 200-watt MAZDA C lamps.

Four outlets—Four 100-watt MAZDA C lamps.

Five outlets—Four 75-watt and one 100-watt MAZDA C lamps.

This assumes that similar reflecting or diffusing equipments are used with each of these combinations.



FIG. 6

Night View of the Furniture Department in One of the Most Progressive Stores of the Country. Very comfortable soft illumination is provided by 100-watt MAZDA C lamps in metal and glass semi-indirect fixtures. An orange red silk shade surrounds the reflector and produces a warm homelike effect.

As a general rule, it is never advisable to place lamps further apart than the ceiling height. In many stores the ceiling of the first floor is much higher than those of the upper floors, and while one large unit per bay might be satisfactory on the main floor the others would probably require at least two outlets per bay.

There are advantages on both sides of the question of the number of outlets per bay. Using a few outlets keeps the cost of wiring at a minimum and permits the economical use of the larger,

more efficient lamps. On the other hand, with the smaller lamps the light at any one point is received from a greater number of sources; hence the possibility of shadows is lessened, and the failure of one unit does not put a section in darkness. It is desirable to have an even distribution of light at the counter level, in order that there may be no spots in shadow. This condition can be fulfilled by hanging the lamps at suitable heights. In general the following rule applies:

It is always desirable to place lamps as high as possible to keep the light sources from the line of vision, but this should not be carried to an extreme so that a distorted appearance results.

This entire subject is covered in data and curves in Bulletin Index 13, "Calculation of the Lighting Installation." Knowing the intensity of light in foot-candles desired, the type of unit, color of walls and ceiling, it becomes a relatively simple matter to determine the size of lamp, spacing and hanging height which will produce the necessary illumination.

Present Practice

In order to obtain data as to present practice in the lighting of large dry goods and department stores, inspection was made of practically all the leading stores of this nature throughout the United States.

The following is a brief summary of the results of this investigation:

The store is usually divided into bays, by supporting columns, and the average dimension of these is 20 by 20 feet. The ceiling height in the majority is such as to permit satisfactory illumination with one outlet per bay on the first floor, while the upper floors are usually provided with 2 or 4 outlets in each section. In the more recent installations the larger number of outlets is applied to all floors. A few examples of the 3 and 5 outlet arrangement were noted.

All of the equipments mentioned under the section on choice of a reflector are employed. Diffusing enclosing globes of various styles with single stem or chain suspension predominate, patent semi-enclosing units and semi-indirect fixtures of various types come next in order of importance. Quite a few notable installations of totally indirect lighting were encountered. Opalescent and prismatic deep bowl reflectors on single chain or stem fixtures have a wide application where expense must be kept at a minimum.

Common sense in the choice of equipment is evidenced by the rapidly decreasing use of multiple unit fixtures for general lighting.

Occasionally, however, where enclosing globes are used on the main floor, opalescent bowl direct lighting reflectors are used on some of the upper floors. The basement is usually less elaborately lighted, in some cases the fixtures merely consist of lamp, socket, direct lighting reflector, and short length of lamp cord. In other cases direct lighting is used with close ceiling type fixtures.

As will be pointed out later, there are certain parts of the store, such as the restaurant, ladies' waiting room, and jewelry show



FIG. 7

Where Low Ceilings Prevail, It is Often Essential to Use Open Bowl Shaped Opalescent Glass Reflectors. These should be of such a size as to adequately hide the lamp and the lower part of the bulb must be of a diffusing character.

rooms which demand special illumination, and the most progressive stores light these portions in a manner distinctive from the rest of the store.

The advantage of light colored surroundings are recognized and pure white side walls, columns and ceiling prevail. Dark room finishes are indeed rare.

Inasmuch as the store is constantly under the surveillance of a rather critical public, cleanliness is quite general and lighting

equipment better maintained in the large store than in almost any other class of service.

Special Considerations

Up to this point the discussion has been devoted entirely to a consideration of general store lighting. The uses of electricity in the form of light and power in and about the store are so numerous that it is impractical to go into detail. For example, the strident voice of the sales-girl calling the floor-walker is now replaced by the silent signal light operated by the mere pushing of a button; miniature electric signs direct the customer to the particular department he is seeking, by the aid of electric light show cases stand out and display their goods as miniature show windows. There are certain portions of the store which demand special treatment. These are outlined in brief below.

Stairs

It is necessary that these be particularly well illuminated to eliminate the likelihood of accidents. Proper attention should be paid to the equipment on lamps near the stairway. If a reflector is missing and the bright filament of a bare lamp in the field of view, one is likely to be temporarily blinded, stumble and fall. In such an event, the management might well be judged guilty of neglect.

The general illumination will in most cases provide sufficient light for the stairways, but, if they are located so that they are in partial shadow, it is necessary to use wall brackets or ceiling outlets with medium size lamps. These can be equipped with reflectors harmonizing with the unit adopted for general illumination. In the case of enclosed stairways an outlet should be provided at each landing. It is well to have emergency lighting circuits provided for the stairs and main exits.

Elevators

These should have sufficient light effective on the floor so that passengers can readily see the position of it when entering or leaving. Many special devices are available for illuminating the edge of the car. One of these consists of a perforated plate with glass inserts, and lamps below the floor shining through this plate. Another scheme is arranged so that when the car is stopped a small lamp enclosed in a reflecting device at the side of the door is turned on, sending a beam of light across the floor. For general illumination of the car itself it is customary to provide a diffusing glass hemisphere at the center of the roof equipped with two small lamps.

In case one should fail, the other will still be in service. The space around the entrance to the elevator should be especially well lighted on account of the confusion resulting from crowding. As previously mentioned, unshielded light sources near the elevator entrance constitute a serious accident hazard.

Cashier's Department and Offices

In the former the money drawers and tables must be illuminated to a high intensity to insure speed and accuracy in change making.



FIG. 8

Night View of a Furniture Department Lighted by MAZDA C Lamps in the New Type of Flattened Enclosing Globe. This form of equipment gives a somewhat higher utilization of light than the ordinary spherical globe.

with a minimum amount of eye fatigue. The lighting of the offices should receive careful attention, for it is most important to protect the eyesight of those devoting their time to clerical work and accounting. The data on bank lighting given in Bulletin Index 30, "The Lighting of Public Buildings," can be applied directly to cashier's department, while the office illumination can be planned in accordance with the rules laid down in Bulletin Index 35, "The Lighting of Office Buildings."

Shipping and Service Rooms

In most instances but little attention is paid to this portion of the building, and drop lights with inefficient lamps and poor

reflectors are scattered haphazardly about. It is real economy to install a modern system of general illumination, employing efficient R L M Standard dome reflectors and Bowl Enameled MAZDA C lamps as discussed in Bulletin Index 69, "The Lighting of Piers and Warehouses."

Ladies' Waiting Room

A low intensity of soft or well diffused illumination is desirable here so that the fatigued shopper can rest in comfort. The artistic features predominate in the choice of lighting equipment. Methods which are used in the home are applicable. The free use of portable or floor lamps with silk and other decorative shades adds to the coziness of the atmosphere. See Bulletin Index 41, "Residence Lighting."

Cut-glass and Jewelry Departments

If the light is too diffused, much of the desirable sparkle and life of the merchandise is lost. Direct lighting with clear lamps produces the best effects. Crystal chandeliers are often in good harmony. The quality of light produced by the Daylight MAZDA lamp is pronounced by experts as advantageous in examining and displaying precious stones.

Art Department

Special lighting arrangements are quite essential to provide even illumination over the entire wall surface. (See Bulletin Index 30.) Properly designed mirrored reflectors have proven most satisfactory for this purpose. The fixtures should be neat and finished to match the general decoration of the room, and the lamps should be entirely concealed from view in order that the pictures may be examined with comfort. The general lighting should be of a low intensity and so placed as to have no distraction influence.

Specialty Shops

In many stores portions are set aside in imitation of the small shops found along the boulevards. These offer opportunities for distinctive lighting, with a wide variety of ornamental fixtures to choose from. The question of efficiency does not enter when considering the lighting of these rooms, but some system of decorative value should be chosen. These rooms are treated in a separate publication, Index 34, "The Lighting of Distinctive Shops."

Furniture Department

As mentioned only a moderate intensity of illumination is required in the furniture department, to display the merchandise to the best advantage. It is desirable to purchase it under conditions similar to those which exist in the home where it will be used.

Modified light of a reddish yellow tone is often a desirable feature here giving the impression of warmth. Decorative types of general lighting fixtures are of service and silk shaded portable table



FIG. 9

Daylight MAZDA Lamps in Individual Reflectors Illuminate This Art Exhibit. An effective setting for high grade pictures is an essential element in their merchandising

or floor lamps served from convenience outlets add to the homelike appearance.

The recently introduced practice of fitting up small specimen rooms with the furniture on display has much to commend it from a merchandising standpoint. Frequently, however, no thought is given to the illumination of these sections and the standard commercial or store lighting unit applied. In the home the endeavor is made to have the lighting fixtures harmonize with the period of the room decoration. The large store should there-

fore have available sets of pleasing and appropriate fixtures then as these displays are changed suitable lighting for the dining room, bed room or living room is also provided. The newly developed interchangeable outlet and plug which enables one to "hang a fixture like a picture" to the ceiling or side wall will be a decided asset here.

Building Exterior and Entrance

One's first impressions are always very strong, and if the entrance and exterior of the building have a drawing power a decided psychological advantage is obtained. The main entrance or lobby is often elaborately decorated, and its lighting should be designed so that the architectural beauty is supplemented. An ornate and novel design of fixtures and glassware is often quite important.

Floodlighting the exterior of buildings has become quite prevalent in the last few years, and many well-known stores have properly designed floodlighting which illuminates the entire exterior of the building to the proper intensity, causing it to stand out against the dark background formed by the sky. Floodlighting with incandescent lamps is very practical, and is now almost the universal method. See Bulletin Index 95, "Floodlighting."

The show windows express to a greater degree than any other element the character of the store and their lighting is so important that a bulletin, Index 31, is devoted to this subject alone.

Conclusion

In discussing any class of lighting where individuality plays such a large part as in the store, it is impossible to give definite specifications for all installations; it has been necessary to treat the subject as above, outlining the general principles and discussing the systems applicable for use with particular reference to the problem in hand.

Illustrations scattered through the text picture the application of the various styles of reflecting and diffusing devices mentioned in the discussion. A general idea of the illuminating qualities of these can be obtained. It is well to sum up a few of the points which must be borne in mind in lighting the department store.

One type of unit should be used for an entire floor, except where there are departments which require special lighting, such as the rug rack, cut glass, art display, and the like. Do not have a mixture of all sorts of fixtures in one open space. It is desirable to

space outlets symmetrically with the bays and columns. Many stores which are otherwise pleasingly arranged, have lamps spaced without any regard for uniformity. All lamps on a floor should be hung at the same height. If this rule is not obeyed the store has the appearance of distorted perspective.

In general the first floor requires a higher intensity than the other floors, not only for the advertising value but also due to the fact that a person enters here from the daylight and the direct comparison makes the store appear dull if not well lighted.



FIG. 10

Appropriate Lighting Makes This Waiting Room Attractive and Useful

Lamps, reflectors and other accessories should be carefully cleaned at regular intervals. See Bulletin Index 14, "The Maintenance of the Lighting System." Such service improves the appearance of the installation and keeps the illuminating efficiency at its maximum value. The cost of cleaning is a very small item in the operating cost. The periods between cleanings will vary, depending on the atmospheric conditions of the city in which the store is located.

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